

Claims:

1. A method of communication of data in a mobile telecommunications network, the method comprising:

5 at a transmitter:

 grouping data into a first sequence of bits and a second sequence of bits,

 modulating a signal with the bits of the first sequence so that the bits of the first sequence have a first level of communication error protection provided by the modulation and with the bits of the second sequence so that the bits of the second sequence have a second level of communication error protection provided by the modulation less than the first level of communication error protection, and

10 transmitting the signal; and

15 at a receiver:

 detecting estimates of the bits of the first sequence from the signal, determining contributions to the signal corresponding to the estimates of the bits of the first sequence,

 cancelling the contributions from the signal so as to produce a modified signal,

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 detecting estimates of the bits of the second sequence from the modified signal.

2. A method according to claim 1, including the steps of: at the transmitter encoding each of the sequences of bits by including error check data into the sequence of bits before modulation, and at the receiver decoding the estimates of the bits of each sequence so as to retrieve the data.

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3. A method according to claim 2, in which the sequences are encoded with different levels of further protection provided by error check data.

4. A method according to claim 1, in which the modulation provides a 16 Quadrature Amplitude Modulation signal, and the bits of the first sequence comprise the first two bits of a four bit binary data sequence, and the bits of the second sequence comprise the other two bits of said binary data sequence.
- 5 5. A method according to claim 1, in which at the transmitter the grouping of the data also provides a third sequence of bits, the bits of the third sequence also being used to modulate the signal so that the bits of the third sequence have a third level of communication error protection less than the second level of communication error protection, and
- 10 at the receiver also determining and cancelling contributions to the signal corresponding to the estimates of the bits of the second sequence from the modified signal so as to produce a further modified signal and detecting estimates of the bits of the third sequence from the further modified signal.
- 15 6. A method according to claim 4, in which modulation provides a 64 Quadrature Amplitude Modulation signal, and the bits of the first sequence comprise the first two bits of a six bit 6 binary data sequence, the bits of the second sequence comprise the second two bits of said binary data sequence, and the bits of the third sequence comprise the last two bits of said binary data sequence.
- 20 7. A method according to claim 1, in which the detecting steps are undertaken by circuitry including an a prior probability (APP) detector.
8. A method according to claim 1, in which the detecting steps are undertaken by circuitry including a Multi-Stage Partial Parallel Interference Cancellation (MS-PPIC) detector.
- 25 9. A method according to claim 1, in which the detecting steps are undertaken by a detector giving soft estimates of bits and a decoder giving estimates of the bits based on the soft estimates.

- 10.** A method according to claim 1, in which the signal is processed into a Multiple Input Multiple Output (MIMO) signal for transmission by a space-time processor at the transmitter.
- 11.** A mobile telecommunications network operative to communicate data, the
5 network comprising a transmitter and a receiver,
the transmitter comprising
a selector operative to group data into a first sequence of bits and a
second sequence of bits,
a modulator operative to modulating a signal with the bits of the first
10 sequence so that the bits of the first sequence have a first level of
communication error protection provided by the modulation and with the bits
of the second sequence so that the bits of the second sequence have a second
level of communication error protection provided by the modulation less than
the first level of communication error protection, and
15 a transmitting stage operative to transmit the signal,
the receiver comprising:
a detector operative to detect estimates of the bits of the first sequence
from the signal,
a canceller operative to determine and cancel contributions to the
20 signal corresponding to the estimates of the bits of the first sequence
from the signal so as to produce a modified signal,
a detector operative to detect estimates of the bits of the second
sequence from the modified signal.
- 12.** A method according to claim 11, in which the detector comprises a decoder.
- 13.** A mobile telecommunications transmitter operative to transmit data and
25 comprising:
a selector operative to group the data into a first sequence of bits and a
second sequence of bits,

a modulator operative to modulating a signal with the bits of the first sequence so that the bits of the first sequence have a first level of communication error protection provided by the modulation and with the bits of the second sequence so that the bits of the second sequence have a second level of communication error protection provided by the modulation less than

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the first level of communication error protection, and

a transmitting stage operative to transmit the signal.

14. A mobile telecommunications transmitter according to claim 13 comprising a base station.

10 **15.** A mobile telecommunications transmitter according to claim 13 comprising a mobile user terminal.

16. A mobile telecommunications receiver operative to receive data represented by a signal, the data comprising bits of a first sequence and bits of a second sequence, the signal having been modulated with the bits of the first sequence so that the bits of the first sequence have a first level of communication error protection provided by the modulation and with the bits of the second sequence so that the bits of the second sequence have a second level of communication error protection provided by the modulation less than the first level of communication error protection,

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the receiver comprising:

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a detector operative to detect estimates of the bits of the first order from the signal,

a canceller operative to determine and cancel contributions to the signal corresponding to the estimates of the bits of the first order from the signal so as to produce a modified signal,

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a detector operative to detect estimates of the bits of the second order from the modified signal.

17. A mobile telecommunications receiver according to claim 16 comprising a base station.

- 18.** A mobile telecommunications receiver according to claim 16 comprising a mobile user terminal.